THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 11

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte BRADLEY G. BOONE
and
OODAYE B. SHUKLA

_____

Appeal No. 95-1220
Application 07/972,279[1]

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ON BRIEF

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Before HAIRSTON, BARRETT and FLEMING, ***Administrative Patent Judges***.

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[1] Application for patent filed November 5, 1992.

FLEMING, ***Administrative Patent Judge***.

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 1 through 3, 5, 7 through 10 and 13 through 24. Claims 4, 6, 11 and 12 have been canceled. On January 24, 1994, Appellants filed an after final amendment amending claim 24. The Examiner in an advisory action, mailed February 3, 1994, stated that upon the filing of an appeal, the proposed amendment, filed January 24, 1994, will be entered. We note that the amendment has been entered into the record and thereby, amended claim 24 is properly before us for our consideration.

Appellants' invention relates to optical-digital signal processing systems that extract features from optical images for pattern recognition. On page 4 of the specification, Appellants disclose that Figure 1 shows the key components of the optical-digital processor which employs both angular correlation and Hough transform algorithms.

Appellants disclose on pages 4 through 6 of the specification an angular correlation algorithm that simply calculates the area of overlap versus the angle between the overlapped images. The resulting set of correlation values can be used to recover the boundary of an object. On pages 7 and 8 of the specification, Appellants disclose the Hough transform algorithm. On pages 9 and 10 of the specification and illustrated in Figure 6, Appellants disclose a multi-aperture optical system which optically rotates an image, calculates its Hough transform and recovers its boundary using angular correlation. The replicated images are passed through a fixed mask onto a multiple detector array. The mask consists of a series of rotated half-plane slits as shown in Figure 6, inset (b).

Independent claim 1 is reproduced as follows:

1. A method for extracting the boundary of an object in a sensor input image comprising the steps of:

overlapping a slit and the object in the sensor input image;

rotating the slit relative to the object, the slit thereby sampling the entire boundary of the object; and

calculating for each rotation position an area of overlap of the slit and the object versus an angle between the slit and the object.

The references relied on by the Examiner are as follows:

Crane	3,394,347	July 23, 1968
Peppers et al. (Peppers)	4,862,511	Aug. 29, 1989
Boone et al. (Boone)	5,101,270	Mar. 31, 1992

Martin D. Levine, ***VISION IN MAN AND MACHINE***, 518-19 (1985).

Claims 1 and 2 stand rejected under 35 U.S.C. § 103 as being unpatentable over Crane and Boone. Claim 14 stands rejected under 35 U.S.C. § 103 as being unpatentable over Crane,

Boone and Levine. Claim 15 stands rejected under 35 U.S.C. § 103 as being unpatentable over Crane, Boone and Peppers. Claims 3, 7 through 10, 16 through 22 and 24 stand rejected under 35 U.S.C. § 103 as being unpatentable over Boone and Peppers. Claims 5, 13 and 23 stand rejected under 35 U.S.C. § 103 as being unpatentable over Boone, Peppers and Levine.

Rather than repeat the arguments of Appellants or the Examiner, we make reference to the brief and the answer for the details thereof.

OPINION

After a careful review of the evidence before us, we agree with the Examiner that claims 1, 7, 14 and 24 are properly rejected under 35 U.S.C. § 103. Thus, we will sustain the rejection of these claims but we will reverse the rejection of the remaining claims on appeal for the reasons set forth ***infra***.

On page 6 of the brief, Appellant argues that the Examiner's rejection of claim 1 as being unpatentable in view of Crane and Boone is improper because Crane does not teach the extraction of an object's boundary as recited in the preface of Appellants' claim 1. However, the Examiner is not relying on Crane but instead relies on Boone for this teaching.

On page 3 of the answer, the Examiner shows that Crane teaches the method steps of overlapping a slit and the object in column 2, line 65, through column 3, line 3, as recited in Appellants' claim 1. The Examiner further shows that Crane teaches the method step of rotating the slit relative to the object in column 3, lines 3-5, as recited in

Appellants' claim 1. On page 4 of the answer, the Examiner states that Crane does not disclose calculating for each rotation position an area of overlap of the slit and the object versus an angle between the slit and the object. However, the Examiner points to Boone for this teaching. In particular, the Examiner states that Boone teaches calculating for each rotation position an area of over-lap of an image and an object versus an angle between the image and the object in equation (22) disclosed in column 9. The Examiner further states that Boone suggests the use of a slit in column 10, lines 15-18, to implement this algorithm. The Examiner argues that it would have been obvious to one of ordinary skill in the art to modify the Crane method to include the Boone calculation.

We note that the Appellants have not argued that the Examiner's reasoning for combining Crane and Boone is improper. Appellants do argue that the references do not meet the Appellants' limitation of a method for extracting the boundary of an object as stated in the preface of claim 1. However, we find that Boone teaches in column 10, lines 15-20,

that by selecting a slit as the reference image, the angular cross-correlation algorithm as disclosed in columns 6 through 9 will extract the object boundary. Therefore, we find that Boone would have suggested to those skilled in the art to modify the Crane optical pattern recognition device shown in Figure 3 to use the Boone algorithm to extract the boundary of the object as recited in Appellants' claim 1.

Appellants further argue that Boone does not provide an enabling detail of the use of a slit. However, Appellants have not provided any evidence in the record that Boone is not enabling. Furthermore, the test of obviousness is not whether features of a secondary reference may be bodily incorporated into the primary reference's structure, nor whether the claimed invention is expressly suggested in any one or all of the references; rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. ***See In re Keller***, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981).

In regard to claim 2, Appellants argue that the Examiner has failed to show any evidence in the art that those

skilled in the art would have found it obvious to modify the Boone equation (22) to obtain Appellants' claimed equation. The Appellants submit that the Examiner's reasoning is done with the benefit of hindsight.

It is the burden of the Examiner to establish why one having ordinary skill in the art would have been led to the claimed invention by the reasonable teachings or suggestions found in the prior art, or by a reasonable inference to the artisan contained in such teachings or suggestions. ***In re Sernaker***, 702 F.2d 989, 995, 217 USPQ 1, 6 (Fed. Cir. 1983). In addition, the Federal Circuit states that "[t]he mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification." ***In re Fritch***, 972 F.2d 1260, 1266 n.14, 23 USPQ2d 1780, 1783-84 n.14 (Fed. Cir. 1992), ***citing In re Gordon***, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984). "Additionally, when deter-mining obviousness, the claimed invention should be considered as a

whole; there is no legally recognizable 'heart' of the invention." ***Para-Ordnance Mfg., Inc. v. SGS Importers Int'l, Inc.***, 73 F.3d 1085, 1087, 37 USPQ2d 1237, 1239 (Fed. Cir. 1995), ***cert. denied***, 117 S.Ct. 80 (1996), ***citing W. L. Gore & Assocs., Inc. v. Garlock, Inc.***, 721 F.2d 1540, 1548, 220 USPQ 303, 309 (Fed. Cir. 1983), ***cert. denied***, 469 U.S. 851 (1984).

After a careful review of Boone, we fail to find any suggestion to modify Boone's equation 22 to obtain Appellants' equation as recited in claim 2. Therefore, we will not sustain the Examiner's rejection of claim 2.

Claim 14 stands rejected under 35 U.S.C. § 103 as being unpatentable over Crane, Boone and Levine. On page 6 of the brief, Appellants state that because claim 14 depends from claim 1 which is patentable over Crane and Boone for the reasons stated for claim 1, claim 14 is also not rendered obvious. We note that Appellants do not make any further arguments.

We have found that claim 1 is properly rejected as being unpatentable over Crane and Boone and thereby we do not find that Appellants' arguments for claim 1 overcome the

rejection of claim 14. Appellants have chosen not to argue any of the specific limitations of claim 14 as a basis for patentability. We are not required to raise and/or consider such issues. As stated by our reviewing court in ***In re Baxter Travenol Labs.***, 952 F.2d 388, 391, 21 USPQ2d 1281, 1285 (Fed. Cir. 1991), "[i]t is not the function of this court to examine the claims in greater detail than argued by an appellant, looking for

nonobvious distinctions over the prior art." 37 CFR § 1.192(a) as amended at 58 Fed. Reg. 54510, Oct. 22, 1993, which was controlling at the time of Appellants filing the brief, states as follows:

> The brief . . . must set forth the authorities and arguments on which the appellant will rely to maintain the appeal. Any arguments or authorities not included in the brief may be refused consideration by the Board of Patent Appeals and Interferences.

Also, 37 CFR § 1.192(c)(6)(iv) states:

> For each rejection under 35 U.S.C. 103, the argument shall specify the errors in the rejection and, if appropriate, the specific limitations in the rejected claims which are not described in the prior art relied on in the rejection, and shall explain how such limitations render the claimed subject matter unobvious over the prior art. If the rejection is based upon a combination of references, the argument shall explain why the references, taken as a whole, do not suggest the claimed subject matter, and shall include, as may be appropriate, an explanation of why features disclosed in one reference may not properly be combined with features disclosed in another reference. A general argument that all the limitations are not described in a single reference does not satisfy the requirements of this paragraph.

Thus, 37 CFR § 1.192 provides that this board is not under any greater burden than the court which is not under any burden to raise and/or consider such issues.

Claim 15 stands rejected under 35 U.S.C. § 103 as being unpatentable over Crane, Boone and Peppers. Appellants' claim 15 recites "wherein the Hough transform generating step comprises calculating an annular correlation." On page 7 of the answer, the Examiner states that Peppers teaches calculating an annular correlation in column 11, lines 9-10, in that circular slits used for correlation would yield an

annular correlation. Appellants argue on page 8 of the brief that such a statement is a conclusion and not a showing that Peppers teaches the use of annular correlation.

After a careful review of Peppers, we find that Peppers does not disclose or even suggest the use of annular correlation. We are not inclined to dispense with proof by evidence when the proposition at issue is not supported by a teaching in a prior art reference, common knowledge or unquestionable demonstration. Our reviewing court requires this evidence in order to establish a ***prima facie*** case. ***In re Knapp-Monarch Co.***, 296 F.2d 230, 232, 132 USPQ 6, 8 (CCPA 1961); ***In re Cofer***, 354 F.2d 664, 668, 148 USPQ 268, 271-72 (CCPA 1966).

Claims 3, 7 through 10, 16 through 22 and 24 stand rejected under 35 U.S.C. § 103 as being unpatentable over Boone and Peppers. In regard to independent claim 3, Appellants argue on pages 8 and 9 of the brief that neither Boone nor Peppers teaches "a fixed mask containing a series of rotated slits for passing the replicated sensor input image therethrough." In regard to independent claim 20, Appellants

argue on page 9 of the brief that neither Boone nor Peppers teaches "two fixed masks, a first mask containing a first pattern comprising a series of rotated radial slits and a second mask containing a second pattern comprising a plurality of annuli having different diameters, the first and second fixed masks for passing the replicated images therethrough and extracting the boundary of the object."

Upon a review of Boone and Peppers, we fail to find these limitations as well. The Examiner points to the teaching found in Peppers, column 11, lines 7-14 [sic, 7-15]. Upon review of this portion of Peppers, we note that Peppers teaches that the primitive masks 6a may include a T-shaped slit, an oblique slit, a loop slit and a radial slit as well as horizontal, vertical and cross-shaped slits. We fail to find that this teaching meets a series of rotated slits as recited in Appellants' claim 3 or the two fixed masks as recited in Appellants' claim 20.

In regard to claims 24 and 7, Appellants further argue that it would not have been obvious to modify Boone as proposed by the Examiner with the Peppers teachings. We note

that Appellants have not argued any specific limitation, but only argue whether those skilled in the art would have reasons to make the modification.

The Examiner argues on page 12 of the answer that Boone teaches all of the limitations recited in Appellants' claim 24 other than "a slit for passing the rotated sensor input image therethrough." The Examiner argues that Peppers teaches a slit for passing replicated sensor input images in column 11, lines 7-14 [sic, 7-15] and column 8, lines 10-20, as well as a detector array in column 8, line 67, through column 9, line 6. The Examiner also shows that Boone suggests using a slit as a reference image for determining angular cross-correlation in column 10, lines 15-21.

At the outset, we note that Appellants have indicated on page 5 of the brief the groupings of the claims. In par-ticular, Appellants state that claims 7 and 24 stand or fall together. In addition, on page 9 of the brief, Appellants argue claims 7 and 24 as a group. 37 CFR § 1.192(c)(5) amended October 22, 1993 states:

> For each ground of rejection which appellant contests and which applies to

> more than one claim, it will be presumed that the rejected claims stand or fall together unless a statement is included that the rejected claims do
>
> not stand or fall together, and in the appropriate part or parts of the argument under subparagraph (c)(6) of this section appel-lant presents reasons as to why appellant considers the rejected claims to be separately patentable.

As per 37 CFR § 1.192(c)(7), which was controlling at the time of Appellants filing the brief, we will, thereby, consider Appellant's claims 7 and 24 to stand or fall together, with claim 24 being considered the representative claim.

The Federal Circuit reasons in **Para-Ordnance Mfg.**, 73 F.3d at 1088-89, 37 USPQ2d at 1239-40, that for the determination of obviousness, the court must answer whether one of ordinary skill in the art who sets out to solve the problem and who had before him in his workshop the prior art, would have been reasonably expected to use the solution that is claimed by the Appellants. We find that Boone teaches in column 10, lines 15-18, that by selecting a slit as the reference image, the angular cross-correlation algorithm as

disclosed in columns 6 through 9 will extract the object boundary. Therefore, we find that Boone would have suggested to those skilled in the art to modify the Boone optical-digital signal processor with the Peppers slit and detector array so as to use the Boone algorithm to extract a feature from an object, the boundary of the object, as recited in Appellants' claim 24.

In view of the foregoing, the decision of the Examiner rejecting claims 1, 7, 14 and 24 under 35 U.S.C. § 103 is affirmed; however, the decision of the Examiner rejecting claims 2, 3, 5, 8 through 10, 13 and 15 through 23 under 35 U.S.C. § 103 is reversed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART

KENNETH W. HAIRSTON)
Administrative Patent Judge)

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